uBOX-110

User Manual

Version 1.0

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(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

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The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.
"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

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Replaceable batteries

CAUTION
RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

Contact Information

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Contents

Chapter 1 Introduction

Thank you for purchasing uBOX-110, a reliable embedded box PC produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

Because the hardware specifications might be updated, the content of this documentation will be subject to change without notice. In case any modifications of this documentation occur, the updated version will be available on ASRock's website without further notice. If you require technical support related to this product, please visit our website for specific information about the model you are using.
ASRock's Website: www.asrock.com

The illustrations shown in this manual are examples only, the actual system may differ slightly .

1.1 Package Contents

- 1 x uBOX-110
- 1 x UTX-110 (pre-installed motherboard)
- 1 x Base VESA Mounting Bracket
- 6 x VESA Bracket Screws
- 1 x Power Adapter
- 1 x Quick Installation Guide

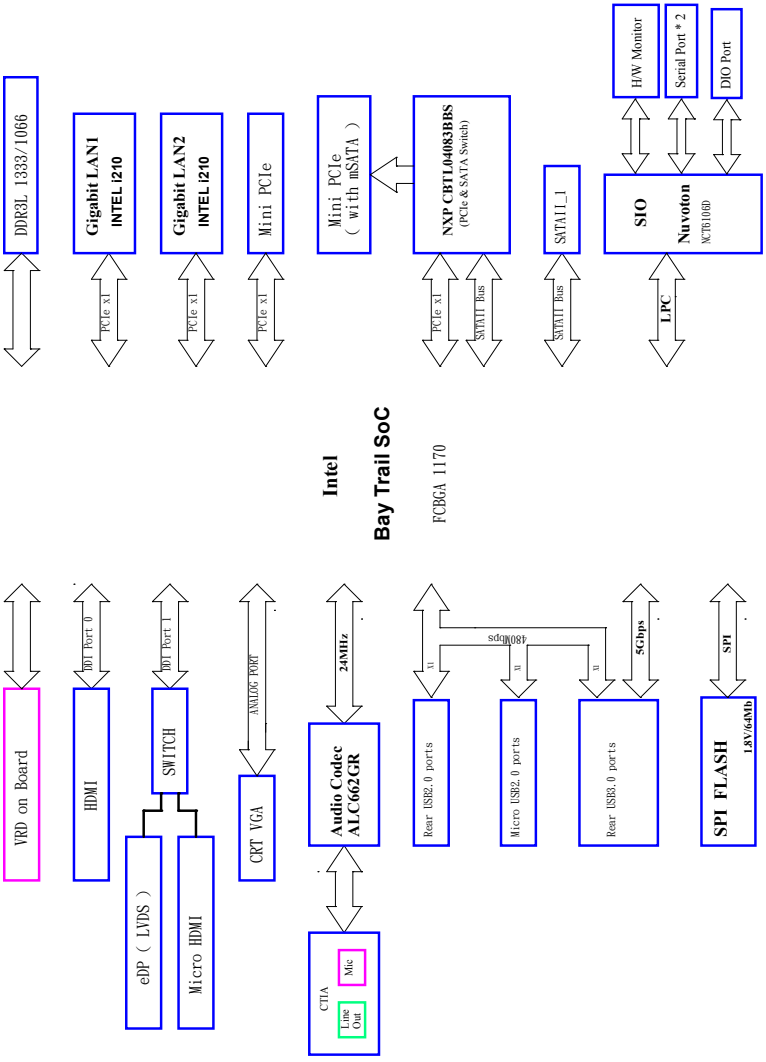
If any items are missing or appear damaged, contact your authorized dealer.

1.2 Product Specifications

uBOX-110	
Processor System	
CPU	Intel® Atom™ Baytrail SoC processor E3845/26/15 Quad/Single up to 2GHz
Memory	1 x DDR3L-1066/1333 SO-DIMM up to 8 GB
Graphic	Intel Gen7
LAN Chipset	Inel i210
Watch Dog	256 Segments,0,1,2,…255sec/min
Rear I/O	
USB	1 USB 3.0 ports/2 USB2.0 ports
LAN	2 RJ45 Port for Gbe
Vedio output	1 x HDMI. 1 x Mini HDMI
Audio	Line out
Expansion	1 x mini PCIe /1 x mSATA
Storage	
Type	mSATA
OS Support	
Window 8/7 Linux	
Certifications	
CE, FCC, Class A	
Environmental	
Operating Temp	0°C~50°C
Storage Temp	-20°C~80°C
Humidity	10%~90%
Mechanical	
Material	Top cover -aluminum extrusion/ Base- metal
Dimension	135*116*25.4 mm
Weight	1kg
Mounting	VESA 75/100 mounting bracket

** For detailed product information, please visit our website: http://www.asrock.com*

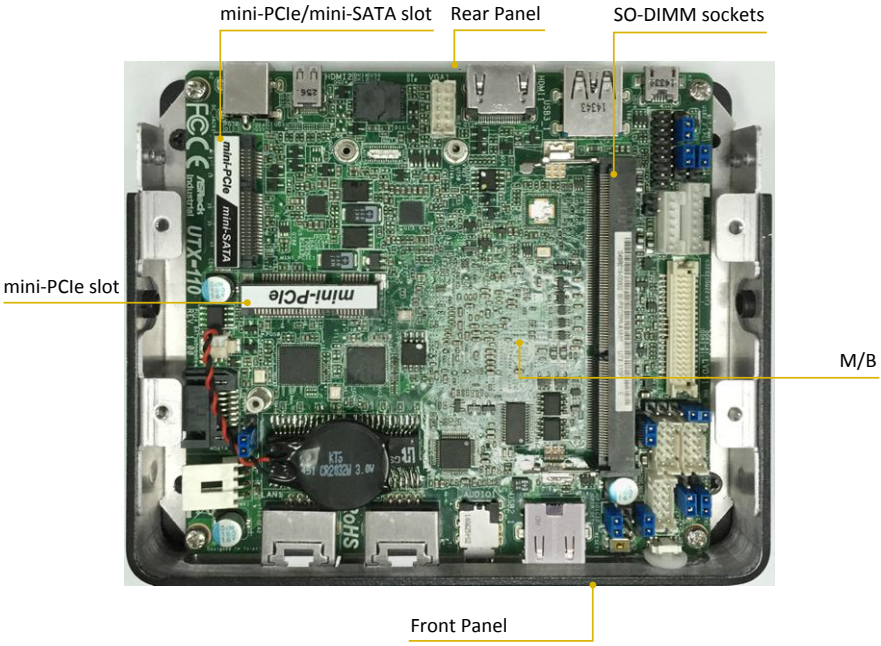
1.3 Block Diagram



Chapter 2 Product Overview

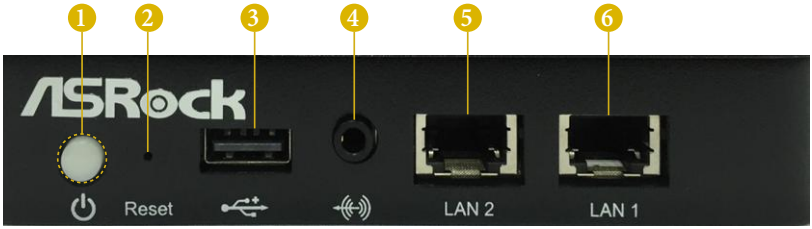
This chapter provides diagrams showing the location of important components of the uBOX-110.

2.1 Inside View



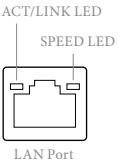
English

2.2 Front View



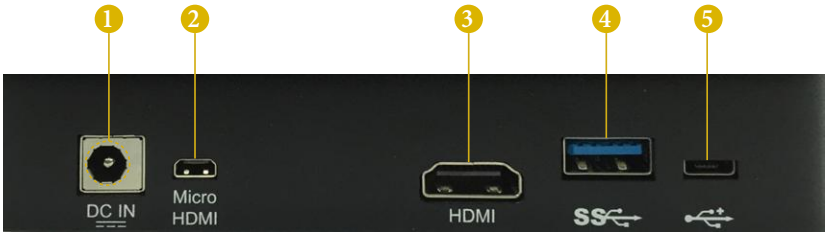
No.	Description
1	Power Button
2	Reset Button
3	USB 2.0 Port
4	3.5mm Audio Jack (CTIA Standard)
5	LAN RJ-45 Port (LAN2)
6	LAN RJ-45 Port (LAN1)

** There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.*



Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Off	Data Activity	Orange	100Mbps connection
On	Link	Green	1Gbps connection

2.3 Rear View



No.	Description	No.	Description
1	DC Jack Port (+12V Only)	4	USB 3.0 Port
2	Micro HDMI Port	5	Micro USB 2.0 Port (USB2_2)
3	HDMI Port		

Chapter 3 Hardware Installation

This chapter provides step-by-step procedures on how to install components.

Installation Procedures

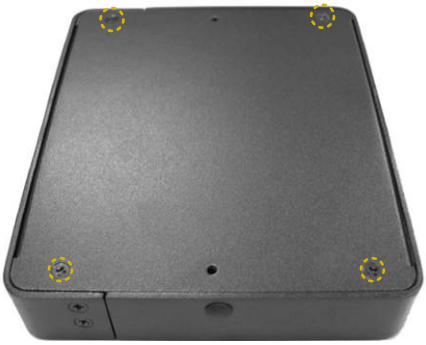
1. Removing the Covers
2. Installing the Memory Modules (SO-DIMM)
3. Installing the mSATA module
4. Inserting the SMA WiFi Antennas **(Optional)**
5. Installing the WiFi Module and the WiFi Antennas **(Optional)**
6. Installing the WiFi Antennas **(Optional)**
7. Replacing the Covers
8. Using the Wall Mounting Bracket **(Optional)**

After making sure that you have properly connected the power supply and all the necessary peripherals, power on the system.

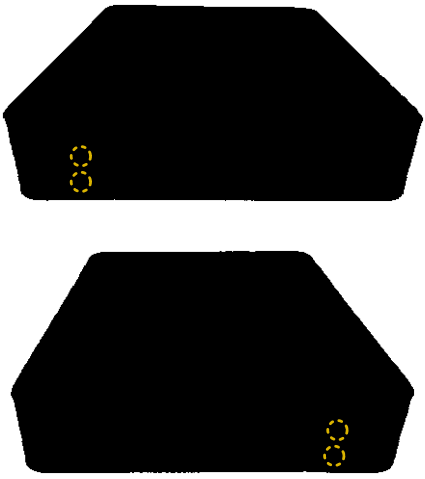
3.1 Removing the Covers

1. Remove the four screws on the bottom case.
2. Remove the two screws on each side to release the rear panel.
3. Lift up and remove the top cover.

1



2



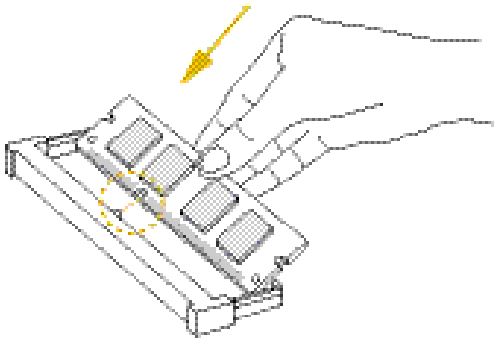
3.2 Installing Memory Modules (SO-DIMM)

This motherboard provides two 204-pin DDR3 (Double Data Rate 3) SO-DIMM slots. Please install the SO-DIMM module into the DDR3_A2 for the first priority.

It is not allowed to install a DDR or DDR2 memory module into a DDR3 slot; otherwise, this motherboard and SO-DIMM may be damaged.

The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the SO-DIMM if you force the SO-DIMM into the slot at incorrect orientation.

1



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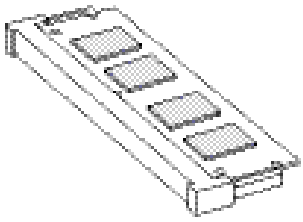


3.3 Installing the mSATA Module

1. Align and gently insert the mSATA Module into the mini-PCIe/mini-SATA slot (MINI_PCIE2).
2. Tighten the screw that holds the module in place.
3. Tighten the screw that holds the module in place.
   *Move the stando based on the module type.

1

2

English

3.4 Inserting the SMA WiFi Antennas (Optional)

1. Insert the RP-SMA Wi-Fi Antenna Connectors to the antenna ports.
2. Then fasten the screw nuts to secure the antenna.

3.5 Installing the WiFi Module (Optional)

1. Align and gently insert the WiFi Module Card into the mini PCI Express slot (MINI_PCIE1).
2. Tighten the screw that holds the card in place.

1

2

English

3.6 Installing the WiFi Antennas (Optional)

1. Attach the SMA Wi-Fi Antenna Cables to the WiFi Module.
2. Connect the two WiFi 2.4/5 GHz Antennas to the antenna connectors. Turn the antenna clockwise until it is securely connected.
3. Set the WiFi 2.4/5 GHz Antenna at 90-degree angle.
   *You may need to adjust the direction of the antenna for a stronger signal.

1

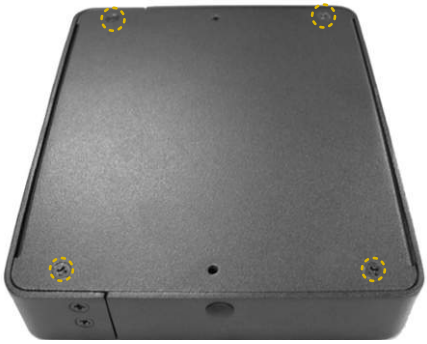
2

3

3.7 Replacing the Covers

1. Replace the boom cover.
2. Secure the four screws at the boom.
3. Secure the the two screws on each side.

2



3

3.8 Using the Wall Mounting Bracket

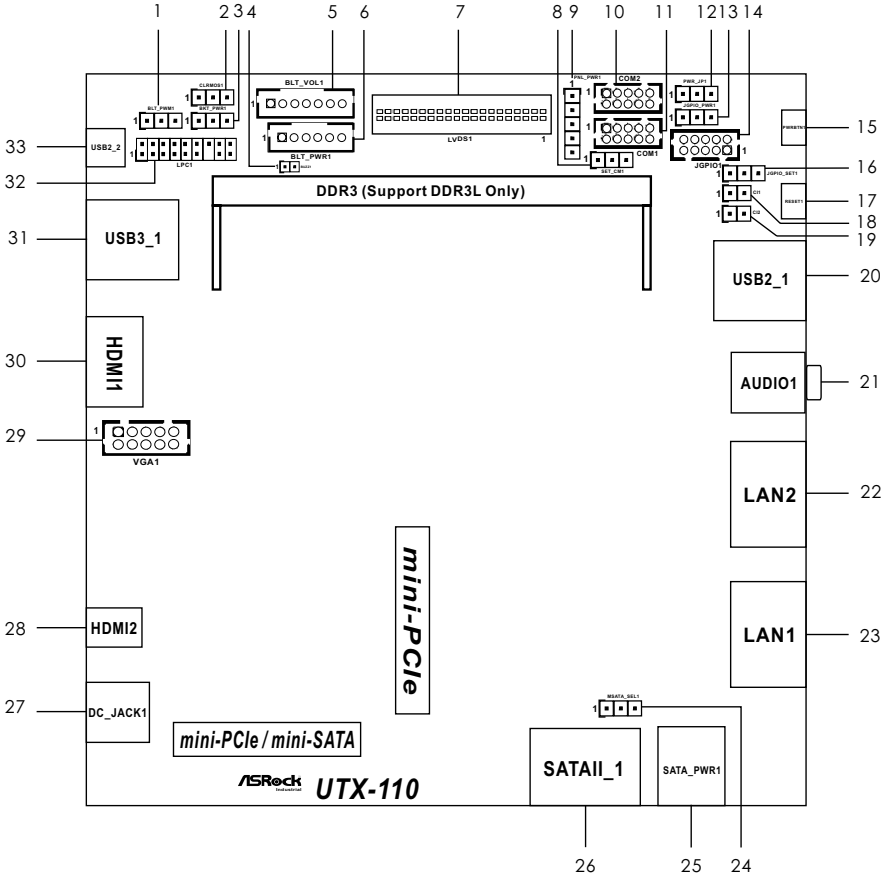
1. Attach the Wall Mounting Bracket to the base of uBOX-110 using the four screws.
   *Choose mounting holes **A (75 mm × 75 mm)** or **B (100 mm × 100 mm)** depending on the mounting hole pattern of your LCD screen.
2. Mount the uBOX-110 to the wall using the two screws.

1

2

Chapter 4 Motherboard

4.1 Motherboard Layout



No.	Description
1	Backlight Control Level (BLT_PWM1)
2	Clear CMOS Header
3	Backlight Power Select (LCD_BLT_VCC) (BKT_PWR1)
4	2-Pin Buzzer Header
5	Backlight & Amp Volume Control (BLT_VOL1)
6	Inverter Power Control Wafer (BLT_PWR1)
7	LVDS Panel Connector
8	COM1 Pin9 PWR Setting
9	Panel Power Select (LCD_VCC) (PNL_PWR1)
10	COM Port Header (COM2)
11	COM Port Header (COM1)
12	ATX/AT Mode Select
13	Digital Input / Output Power Select
14	Digital Input / Output Pin Header
15	GPIO Default Setting
16	Chassis Intrusion Header (CI1)
17	Chassis Intrusion Header (CI2)
18	mSATA Select
19	SATA Power Output Connector
20	SATA2 Connector (SATAII_1)
21	VGA Connector
22	LPC Header

4.2 Motherboard Specifications

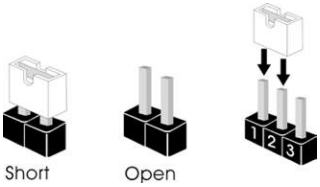
Form Factor	Dimensions	111.76 x 116.84 mm (10 layer)
Processor System	CPU	Intel® new Atom™ Baytrail-I
		Supports Hyper-Threading Technology
		Default E3826 Dual Core Processor
		Optional E3845/3815 Quad/Single Core Processor
	Core Number	(By CPU, Max 4)
	Max Speed	(By CPU)
	L2 Cache	(By CPU)
	Chipset	(By CPU)
	BIOS	UEFI
Expansion Slot	PCI	0
	Mini-PCIe	1 x Full Size co-lay with mSATA
	mSATA	1 (Full Size)
	PCIe	0
	SIM	1
	CFast Card Socket	0
Memory	Technology	Single Channel DDR3L 1066/1333 MHz SDRAM
	Max.	4/8GB
	Socket	1 x SO-DIMM
Graphics	Controller	Intel® Gen7 Intel® Graphics DX 11, OGL3.2
	VRAM	Shared Memory
	VGA	Supports max. resolution 1920 x 1200
	LVDS	Dual channel 24-bit, max resolution 1920 x 1200 @60Hz
	HDMI	Supports HDMI 1.4a, max resolution 1920 x 1200
	DVI	N/A
	DisplayPort	N/A
	Multi Display	Yes (Dual Display)
Ethernet	Ethernet Controller	10/100/1000 Mbps
		2 x Intel® 210
	Connector	2 x RJ-45
SATA	Max Data Transfer Rate	SATA2 (3.0Gb/s)

Rear I/O	VGA	0
	DVI	0
	HDMI	2 (1 x HDMI, 1 x Micro HDMI)
	DisplayPort	0
	Ethernet	2
	USB	1 x USB 3.0 Compliant, 1 x USB2.0 Compliant 1 x micro USB 2.0 SMT type connector
	Audio	1 (Line out/Mic out)
	Serial	0
	eSATA	0
	PS/2	0
Internal Connector	USB	0
	LVDS/ Inverter	1/1
	VGA	1 (Pin heater 2.0 mm Pitch)
	Serial	(RS-232/422/485 x 1. RS232 x 1) Pin heater 2.0 mm pitch COM1 Pin9 (+5V & +12V)
	SATA	1 x SATA2 (3.0Gb/s)
	mPCIe	2 (Full/Half Size)
	Parallel	0
	mSATA	1
	IrDA	0
	GPIO 8-bit	4 x GPI + 4 x GPO Pin heater 2.0 mm pitch
	SATA PWR Output Con	1
	Speaker Header	1
Watchdog Timer	Output	From Super I/O to drag RESETCON#
	Interval	256 segments, 0,1,2…255sec/min
Power Requirements	Input PWR	12V DC Jack
	Power On	AT/ATX Supported AT: Directly PWR on as power input ready ATX: Press button to PWR on after power input ready
Environment	Temperature	0°C – 60°C

** For detailed product information, please visit our website: http://www.asrock.com*

4.3 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is "Short". If no jumper cap is placed on the pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when a jumper cap is placed on these 2 pins.



Clear CMOS Jumper (CLRCMOS1) (see p.15, No. 2)	 Default Clear CMOS	

CLRCMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, and user default profile will be cleared only if the CMOS battery is removed.

Digital Input/Output PWR Select (3-pin JGPIO_ PWR1) (see p.15, No. 13)		1-2 : +12V 2-3 : +5V
ATX/AT Mode Selection (3-pin PWR_JP1) (see p.15, No. 12)		1-2: AT Mode 2-3: ATX Mode

English

Panel Power Selection (LCD_ VCC) (5-pin PNL_PWR1) (see p.15, No. 9)		Use this to set up the VDD power of the LVDS connector. 1-2: +3V 2-3: +5V 3-4: +5V 4-5: +12V
Backlight Power Selection (LCD_BLT_VCC) (3-pin BKT_PWR1) (see p.15 No. 3)		Use this to set up the backlight power of the LVDS connector. 1-2: +5V 2-3: +12V
Backlight Control Level (3-pin BLT_PWM1) (see p.15 No. 1)		1-2: +3V 2-3: +5V
COM Port PWR Setting Header (5-pin SET_CM1) (see p.15 No. 8)		1-2: +5V 2-3: +12V
mSATA Selection (3-pin MSATA_SEL1) (see p.15 No. 18)		1-2: mini-PCIe 2-3: mSATA
GPIO Default Setting (3-pin JGPIO_SET1) (see p.15 No. 15)		1-2: Pull-High 2-3: Pull-Low

4.4 Onboard Headers and Connectors

Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard.

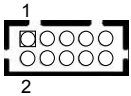
SATA2 Connector
(SATAII_1)
(see p.15, No. 20)


SATAII_1

This Serial ATA2 (SATA2) connector supports SATA data cables for internal storage devices. The current SATA2 interface allows up to 3.0 Gb/s data transfer rate.

SATA Power Output Connector
(4-pin SATA_PWR1)
(see p.15 No. 19)

COM Port Headers
(10-pin COM1)
(see p.15 No. 11)



(10-pin COM2)
(see p.15 No. 10)

PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	DDCD#	3	TTXD	5	GND	7	RRTS#	9	DUMMY
2	RRXD	4	DDTR#	6	DDSR#	8	CCTS#	10	DUMMY

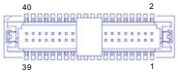
This motherboard supports RS232/422/485 on COM1 port. Please refer to below table for the pin definition. In addition, COM1 port (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to page 29 for details.

COM1 Port Pin Definition

PIN	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	RX+	N/A
3	TXD	TX+	RTX+
4	DTR	RX-	N/A
5	GND	GND	GND
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	N/A	N/A
9	NA/+5V/+12V	N/A	N/A

English

LVDS Panel Connector
(40-pin LVDS1)
(see p.15, No. 7)

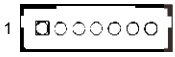


PIN	Signal Name	PIN	Signal Name
1	LCD_VCC	2	LCD_VCC
3	+3V	4	N/A
5	N/A	6	LVDS_A_ DATA0#
7	LVDS_A_ DATA0	8	GND1
9	LVDS_A_ DATA1#	10	LVDS_A_ DATA1
11	GND6	12	LVDS_A_ DATA2#
13	LVDS_A_ DATA2	14	GND2
15	LVDS_A_ DATA3#	16	LVDS_A_ DATA3
17	GND7	18	LVDS_A_CLK#
19	LVDS_A_CLK	20	GND3
21	LVDS_B_ DATA0#	22	LVDS_B_ DATA0
23	GND8	24	LVDS_B_ DATA1#
25	LVDS_B_ DATA1	26	GND4
27	LVDS_B_ DATA2#	28	LVDS_B_ DATA2
29	DPLVDD_EN	30	LVDS_B_ DATA3#
31	LVDS_B_ DATA3	32	GND5
33	LVDS_B_CLK#	34	LVDS_B_CLK
35	GND9	36	CON_LBKLT_ EN
37	CON_LBKLT_ CTR	38	LCD_BLT_ VCC
39	LCD_BLT_ VCC	40	LCD_BLT_ VCC

Digital Input/Output Pin Header
(10-pin JGPIO1)
(see p.15 No. 14)

PIN	Signal Name	PIN	Signal Name
1	SIO_GP24	2	SIO_GP20
3	SIO_GP25	4	SIO_GP21
5	SIO_GP26	6	SIO_GP22
7	SIO_GP27	8	SIO_GP23
9	JGPIO_PWR	10	GND

Backlight & Amp Volume Control
(7-pin BLT_VOL1)
(see p.15 No. 5)

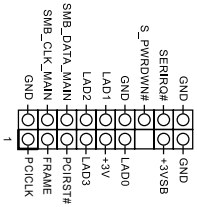


PIN	Signal Name
1	GPIO_VOL_UP
2	GPIO_VOL_DW
3	PWRDN
4	GPIO_BLT_UP
5	GPIO_BLT_DW
6	GND
7	GND

Inverter Power Control Wafer
(6-pin BLT_PWR1)
(see p.15 No. 6)

PIN	Signal Name
1	GND
2	GND
3	CON_LBKLT_CTL
4	CON_LBKLT_EN
5	LCD_BLT_VCC
6	LCD_BLT_VCC

LPC Header
(17-pin LPC1)
(see p.15 No. 22)



This connector supports Trusted Platform Module (TPM)system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

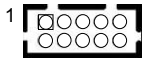
Chassis Intrusion Headers
(2-pin CI1)
(see p.15 No. 16)
(2-pin CI2)
(see p.15 No. 17)

This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.

English

Buzzer Header
(2-pin BUZZ1)
(see p.15 No. 4)

VGA Connector
(10-pin VGA1)
(see p.15 No. 21)



PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	RED	3	GREEN	5	BLUE	7	HSYNC	9	DDC_CLK
2	GND	4	GND	6	GND	8	VSYNC	10	DDC_ DATA

4.5 Expansion Slots (mini-PCIe and mini-PCIe/mini-SATA Slots)

There is 1 mini-PCIe slot and 1 mini-PCIe/mini-SATA slot on this motherboard.

Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

mini-PCIe slot:

MINI_PCIE1 (mini-PCIe slot; half size) is used for PCI Express mini cards.

mini-PCIe/mini-SATA slot:

MINI_PCIE2 (mini-PCIe/mini-SATA slot; full size) is used for PCI Express mini cards or mSATA cards.